

REMARKS

Applicant thanks the Examiner for the very thorough consideration given the present application.

Claims 1, 3-10 and 12-16 are now present in this application. Claims 1 and 6 are independent.

Claims 1, 6 and 10 have been amended. Reconsideration of this application, as amended, is respectfully requested.

Rejection Under 35 U.S.C. 112, First Paragraph

Claims 1 and 6 are rejected under 35 U.S.C. 112, first paragraph as containing subject matter which is not described in the specification. Claim 10 is rejected under 35 U.S.C. 112, first paragraph as containing subject matter which was not described in the specification in a way as to enable one skilled in the art to make and/or use the invention. These rejections are respectfully traversed.

The Examiner asserts that the limitation "the etch/strip apparatus is a single piece of equipment" is not supported by the specification. While Applicant maintains that this limitation is supported in the specification, claims 1 and 6 have been amended, and do not now recite "the etch/strip apparatus is a single piece of equipment" Reconsideration and withdrawal of rejection is respectfully requested.

At paragraph 4 of the Office Action the Examiner interprets a "pipe shower" as a "means of inserting fluid". However, the Examiner states that the structure of

the pipe shower is unclear. The Applicant requests that the Examiner consider that all of the modular components shown in the Applicant's FIG.3 are presented therein in "modular" or block diagram form. This is partly due to the fact the basic structure of these is within the purview of those of ordinary skill in the art.

The modular presentation of the pipe shower is consistent with the modular presentation of the other modules of the apparatus. Like the etch module, rinse module, cleaning module and strip module, the pipe shower structure is sufficiently conveyed by its stated purpose, that is, to provide moisture to the substrate. The structure of a pipe shower for this purpose is certainly much less sophisticated than the structure of the other modular components. The structure thereof (being comparatively simple) is well within the purview of those of ordinary skill in the art. Nevertheless, claim 10 has been amended to explain the subject matter recited therein with more clarity. Reconsideration and withdrawal of this rejection is respectfully requested.

Rejection Under 35 U.S.C. 102

Claims 1, 3-9 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Publication 09-106978 to Miyazaki. This rejection is respectfully traversed.

Miyazaki discloses an etching chamber 4, wherein etching of a wafer is performed. After etching, a wafer leaves the etching chamber 4 and is conveyed to a temporary storage unit 6 (interim storage) via a wafer conveyance machine 5.

Thereafter, the wafers are moved into an ashing chamber 8 (stripping chamber) wherein stripping occurs. There are several points (at least three) to be noted here. First, it is apparent at a glance that the etching and stripping chambers of Miyazaki are not unified, but rather, they are joined by wafer conveyance machine 5, and yet further, by temporary storage unit 6 (also disposed therebetween). Secondly, no rinsing operation occurs between the etching and stripping operations. Thirdly, the wafers are exposed to the atmosphere immediately after the ashing process is completed (see Miyazaki, paragraph 18). In other words, a substrate is not rinsed prior to stripping, and the etching chamber and the stripping chamber are not unified such that a substrate is moved internally therebetween without being subject to exposure to the atmosphere. Neither are the etching chamber 4 and the stripping chamber 8 unified, because there are at least three modules intervening between them.

Therefore, Miyazaki fails to teach a combination of elements in an etch/strip apparatus integrated with cleaning equipment, including said etching line comprising an etching module and a rinse module, for etching and rinsing a substrate prior to stripping, said etching module and said rinse module being unified such that a substrate is moved internally between said unified modules with no exposure to the outside thereof, as recited in independent claim 1, as amended.

Further, in Miyazaki, there are processing delays because of the hold times and synchronization requirements associated with temporary storage 6, carriers 7

and stripping chamber 8. It is not a flow-through operation. Therefore, for these reasons, and at least the reasons stated with respect to independent claim 1, Miyazaki fails to teach a combination of elements in an integrated etch/strip/clean apparatus including said stripping line being unified with said etching line such that the substrate stays inside of the unified lines during movement and processing, thereby reducing synchronization and hold times and an overall processing time, as recited in independent claim 6, as amended.

Claims 3-5, 7-9 and 12-14 depend, either directly or indirectly on independent claims 1 and 6, and therefore are patentable for at least the reasons stated with respect to independent claims 1 and 6. Reconsideration and withdrawal of this art grounds of rejection is respectfully requested.

Rejection Under 35 U.S.C. 103(a)

Claims 10, 15 and 16

Claim 10 stands rejected under 35 U.S.C. 103(a) as being unpatentable of Miyazaki in view of Japanese Patent Publication 06-224145 to Iwai, and claims 15 and 16 stand rejected over Miyazaki in view of U.S. Patent No. 6,007,675 to Toshima. These rejections are respectfully traversed.

Miyazaki, argued above with respect to independent claims 1 and 6, fails to disclose the above-recited features of independent claims 1 and 6 (as amended). Neither Iwai, nor Toshima can fill these vacancies.

Claims 10, 15 and 16 depend, either directly or indirectly on independent claims 1 and 6. Since neither Miyazaki, nor Iwai, nor Toshima discloses or suggests the above-recited features of independent claims 1 and 6 (as amended) neither Miyazaki in view of Iwai, nor Miyazaki in view of Toshima can render claims 10, 15 and 16 obvious to one of ordinary skill in the art. Reconsideration and withdrawal of these art grounds of rejection are respectfully requested.

Claims 1, 3-9 and 12-16

Claims 1, 3-9 and 12-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,672,239 to DeOrnellas in view of U.S. Patent No. 6,007,675 to Toshima. This rejection is respectfully traversed.

DeOrnellas teaches an apparatus directed to an integral pre-strip operation between an etching operation and a stripping operation. However, because the system employed in DeOrnellas is not a closed system, the wafer must be moved in an out of (and between) modules by various robot arms. Further, hold times are necessary and synchronization is required, thereby increasing overall processing times. By contrast, the Applicant's claimed system is a flow through system wherein a substrate remains within the unified lines or modules.

Particularly, DeOrnellas utilizes robot arm 38, robot arm 32, and closable openings 27, 40, 42 and 44 to move a wafer between modules (see Fig.1). This process of opening, transferring, holding and closing involves a great deal of hold time, and thus synchronization between operations. The rinse operation is

performed twice in the same module, that is, a wafer is moved in and out of module 25 twice. Hence, the modules of DeOrnellas cannot be referred to as "lines" in a traditional process sense because they are not arranged in a line configuration in either a physical sense or in an operational sense. The modules of DeOrnellas are merely arranged around a central robotic arm 38, which extracts a wafer from one module, and then inserts the wafer into another module through open/close doors.

Therefore, DeOrnellas fails to teach or suggest a combination of elements in an etch/strip apparatus integrated with cleaning equipment, including said etching line comprising an etching module and a rinse module, for etching and rinsing a substrate prior to stripping, said etching module and said rinse module being unified such that a substrate is moved internally between said unified modules with no exposure to the outside thereof, as recited in independent claim 1, as amended.

Further, DeOrnellas fails to teach or suggest a combination of elements in an integrated etch/strip/clean apparatus including said stripping line being unified with said etching line such that the substrate stays inside of the unified lines during movement and processing, thereby reducing synchronization and hold times and an overall processing time, as recited in independent claim 6, as amended. Toshima cannot fill these vacancies.

Claims 3-9 and 12-14 depend, either directly or indirectly on independent claims 1 and 6. Since neither Miyazaki, nor Toshima teaches or suggests the

above-recited features on independent claims 1 and 6, Miyazaki, in view of Toshima cannot render claims 1, 3-9 and 12-14 obvious to one of ordinary skill in the art. Reconsideration and withdrawal of this art grounds of rejection is respectfully requested.

Claim 10

Claim 10 stands rejected under 25 U.S.C. 103(a) over DeOrnellas in view of Toshima and further in view of Iwai. This rejection is respectfully traversed.

DeOrnellas, argued above with respect to independent claim 6, fails to teach or suggest a combination of elements in an integrated etch/strip/clean apparatus including said stripping line being unified with said etching line such that the substrate stays inside of the unified lines during movement and processing, thereby reducing synchronization and hold times and an overall processing time, as recited in independent claim 6, as amended. Neither Toshima, nor Iwai can fill the deficiency of DeOrnellas. Claim 10 depends on claim 6. Since neither DeOrnellas, nor Toshima, nor Iwai discloses or suggests the above-recited features of independent claim 6, DeOrnellas, in view of Toshima, and further in view of Iwai cannot render claim 10 obvious to one of ordinary skill in the art.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the

Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

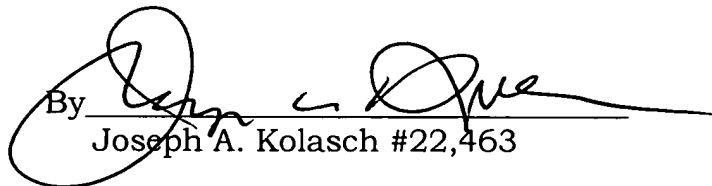
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Percy L. Square, Registration No. 51,084, at (703) 205-8034, in the Washington, D.C. area.

Prompt and favorable consideration of this Amendment is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 
Joseph A. Kolasch #22,463

JAK/PLS: asc
2658-0250P

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000